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Docket No. 50-321

HL-6307

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant - Unit 1  
Licensee Event Report  
Turbine Overspeed Control Valve of the  
High Pressure Coolant Injection System Fails

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(v), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning failure of a high pressure coolant injection system turbine overspeed control valve.

Respectfully submitted,

A handwritten signature in cursive script that reads "H. L. Sumner, Jr.".

H. L. Sumner, Jr.

IFL/eb

Enclosure: LER 50-321/2002-004

cc: Southern Nuclear Operating Company  
Mr. P. H. Wells, Nuclear Plant General Manager  
SNC Document Management (R-Type A02.001)

U.S. Nuclear Regulatory Commission, Washington, D.C.  
Mr. Joseph Colaccino, Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II  
Mr. L. A. Reyes, Regional Administrator  
Mr. J. T. Munday, Senior Resident Inspector - Hatch

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Handwritten initials "IE22" in a cursive script.

NRC FORM 366 (7-2001)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104			EXPIRES 7/31/2004			
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)										Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to,	
1. FACILITY NAME Edwin I. Hatch Nuclear Plant - Unit 1					2 DOCKET NUMBER 05000-321			3. PAGE 1 OF 4			
4. TITLE Turbine Overspeed Control Valve of the High Pressure Coolant Injection System Fails											
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)	
08	14	2002	2002	004	0	10	11	2002		05000	
									FACILITY NAME	DOCKET NUMBER(S)	
										05000	
9. OPERATING MODE (9)		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)									
1		20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)			
10. POWER LEVEL 100		20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)			
		20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)			
		20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)			
		20.2203(a)(2)(ii)		50.36(c)(2)		X 50.73(a)(2)(v)(B)		OTHER			
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A			
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)					
		20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)					
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)					
		20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)					
12. LICENSEE CONTACT FOR THIS LER											
NAME Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch						TELEPHONE NUMBER (Include Area Code) (912) 537-5880					
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
X	BJ	PCV	T129	Yes							
14. SUPPLEMENTAL REPORT EXPECTED								15. EXPECTED SUBMISSION DATE			
YES (If yes, complete EXPECTED SUBMISSION DATE)				NO X							
16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)											
<p>On 8/14/02 at 1419 EDT, Unit 1 was in the Run mode at a power level of approximately 2763 CMWT (100 percent rated thermal power). Prior to this time on 8/14/02 at 0125 EDT, the High Pressure Coolant Injection (HPCI, EIS Code BJ) system weekly auxiliary oil pump run was performed in accordance with procedure 34SV-SUV-019-0. During a system walk down at 1419 EDT on 8/14/02, oil was discovered on the floor beside the Unit 1 HPCI skid. The oil reservoir level was found below the low level mark. During a subsequent troubleshooting run of the auxiliary oil pump, hydraulic control fluid sprayed out of the hydraulic actuator of the turbine overspeed trip control valve, 1E41-F3082. The HPCI System was declared inoperable following the discovery of the leaking 1E41-F3082 valve actuator. The turbine overspeed trip control valve was repaired. Subsequently, the auxiliary oil pump was started and the system checked for leakage and for proper system pressures with no anomalies identified. The HPCI system was then declared operable on 8/15/02, at 0900 EDT.</p> <p>The cause of the event was a failed hydraulic actuator diaphragm. Corrective actions for this event include the replacement of the failed diaphragm, the installation of a diaphragm with a newer design during the next system outage, and the establishment of a requirement to periodically replace these diaphragms.</p>											

LICENSEE EVENT REPORT (LER)  
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System codes appear in the text as (EIS Code XX).

DESCRIPTION OF EVENT

On 8/14/02 at 1419 EDT, Unit 1 was in the Run mode at a power level of approximately 2763 CMWT (100 percent rated thermal power). Prior to this time on 8/14/02 at 0125 EDT, the High Pressure Coolant Injection (HPCI, EIS Code BJ) system weekly auxiliary oil pump run was performed in accordance with procedure 34SV-SUV-019-0. During a system walk down at 1419 EDT on 8/14/02, oil was discovered on the floor beside the Unit 1 HPCI skid. The oil reservoir level was found to be below the low level. During a subsequent troubleshooting run of the auxiliary oil pump, hydraulic control fluid sprayed out of the hydraulic actuator of the turbine overspeed trip control valve, 1E41-F3082. The HPCI System was declared inoperable following the discovery of the leaking 1E41-F3082 valve actuator. The turbine overspeed trip control valve was repaired. Subsequently, the auxiliary oil pump was started and the system checked for leakage and for proper system pressures with no anomalies identified. The HPCI system was then declared operable on 8/15/02, at 0900 EDT.

Discussions with the valve manufacturer indicated that the shelf life for this diaphragm was 14 years and that the service life for this diaphragm was 15 years. Discussions with our HPCI consultant indicated that he recommended replacing this particular diaphragm during every turbine major inspection (every 6 – 10 years). The failed diaphragm was sent offsite for analysis along with another diaphragm that was received on the same purchase order. The results from this analysis noted that the failure area had the fibers exposed indicating that the base polymeric material had seriously eroded from this area and that this was the result of wear or a random manufacturing defect. The diaphragm that failed and the one that was used to replace it are no longer manufactured. These diaphragms were Buna-N with single ply fabric-reinforcing. The original fabric-reinforced Buna-N diaphragms were designed to satisfy a minimum of 1000 cycles. The newer style diaphragms (Part Number 25471-A2 manufactured in 1991) are Buna-N with two ply fabric reinforcing. These diaphragms are designed to satisfy 100000 cycles.

A similar event occurred at the plant on 6/29/96. As a result of this June 1996 event the diaphragms on both Unit 1 and Unit 2 HPCI Turbine Overspeed Control valves were replaced. The diaphragm that failed in 1996 had been installed for more than 10 years.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

CAUSE OF EVENT

The cause of the event was a failed hydraulic actuator diaphragm. Because this valve failed after only approximately 6 years of service (less than 600 cycles) and the previous diaphragm lasted more than 10 years it has been concluded that the diaphragm material was defective.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is reportable pursuant to 10 CFR 50.73 (a) (2) (v) in that a single event occurred which rendered a single train safety system incapable of performing its intended function. Specifically, with HPCI in operation, the leaking control valve diaphragm would result in a loss of system oil pressure sufficient to render HPCI inoperable.

The HPCI System is designed to provide adequate cooling to limit fuel-clad temperature in the event of a small break in the nuclear steam supply system that does not result in rapid depressurization of the reactor vessel. The Automatic Depressurization System (ADS, EIIS Code JE) is the backup for the HPCI system and is initiated on a low reactor water level condition coincident with a Primary Containment high pressure condition. Upon initiation of ADS, the reactor is depressurized to a point where either the Low Pressure Coolant Injection (LPCI, EIIS Code BO) system or the Core Spray (CS, EIIS Code BM) system can operate to maintain adequate core cooling.

In this event it was determined that a control valve diaphragm had failed. The leak would not have resulted in immediate failure of the HPCI system. HPCI would have been able to operate for some period of time before hydraulic fluid pressure would have decreased enough to affect operation of the turbine. Nonetheless, the CS system, the LPCI system, and ADS system were operable during the event. Consequently, in the event of an accident, these systems would have been capable of mitigating the consequences of such an accident in the absence of the HPCI system.

Based on the above information, it was concluded that this event had no adverse impact on nuclear safety.

CORRECTIVE ACTIONS

The failed diaphragm was replaced 8/15/02 with a single ply fabric reinforced Buna-N diaphragm and the system checked for leakage and proper system pressures with no anomalies identified. During the next Unit 1 HPCI system outage (fall 2003) the diaphragm will be replaced with a newer style diaphragm (Part Number 25471-A2). The new diaphragm is made of Buna-N with two ply fabric reinforcing and is designed for 100000 cycles.

The plant procedures will be revised to require this diaphragm to be replaced during every major turbine inspection (6-10 years). This will be completed prior to the next major turbine inspection.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

The diaphragm installed on HPCI Unit 2 will be replaced with the newer diaphragm made of Buna-N with two ply fabric reinforcing no later than the next system outage, well before it reaches 1000 cycles. This will be completed before June 2003.

ADDITIONAL INFORMATION

No systems other than those previously described in this report were affected by this event.

A previous similar event occurred on the Unit 1 HPCI system on 6/29/96. Corrective actions taken for that event included:

- The diaphragm was replaced on 6/29/96.
- The hydraulic fluid system was checked for leakage and proper operating pressures and HPCI was subsequently returned to service at 2355 EDT on 6/29/96.
- As a precaution, the Unit 2 HPCI turbine overspeed control diaphragm was replaced on 7/19/96.

## Failed Component Information:

Master Parts List: 1E41-F3082

Manufacturer: Terry Corporation

Manufacturer Code: T129

Model Number: 890151A01

Type: Control Valve Actuator Diaphragm

EHS System Code: BJ

EHS Component Code: PCV

Root Cause Code: X

Reportable to NPRDS: Yes